

# Technotherm

## SUPERIOR THERMAL TECHNOLOGY

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## Project 1131-Medrecycler, Rhode Island

### Pyrolysis reactor description

The proposed plant will make use of two pyrolysis reactors designed by Technotherm. The proposed pyrolysis system is a unit where the medical waste feed is converted to a gas in an endothermic process in the absence of oxygen, whereby thermal energy for the reaction is provided externally to the pyrolysis reactor (Fig. 1).

The two pyrolysis reactors (pyrolizers) convert the feed material through various endothermic reactions into a vapour product containing liquid (oil) and gas (syngas) fractions, and a solid product (carbon residue). The pyrolizer is heated externally by using LPG, syngas or solid carbon residue from the pyrolysis process as fuel. The actual conversion takes place inside the reactor, in the absence of oxygen, thus preventing combustion of the feed material from taking place and allowing for production of higher calorific value gas at the exit. The pyrolysis reactors are both sized for a combined load of 2000 kg/hr dry material although they will only be receiving between 1500 and 1929 kg/hr on a dry basis. All downstream equipment is sized for the maximum expected gas flow rate as the design basis. Table 1 shows basic pyrolizer process information.

**Table 1. Pyrolizer Process Data**

|                           |            |
|---------------------------|------------|
| Throughput, kg/hr         | 1,500-1929 |
| Operation Temperature, °C | 800-900    |
| Operational Pressure, kPa | - 0.024    |
| Syngas, Max, kg/hr        | 914        |
| Carbon Residue, kg/hr     | 1015       |

The vapour discharge is separated from the residue product in a dropout box and further in a hot gravity settling chamber and hot cyclone. The vapour product proceeds to the gas clean-up section and the residue product (along with recycled tar) proceeds to the vitrification furnace where it is used as fuel to heat the pyrolizer heating chamber.

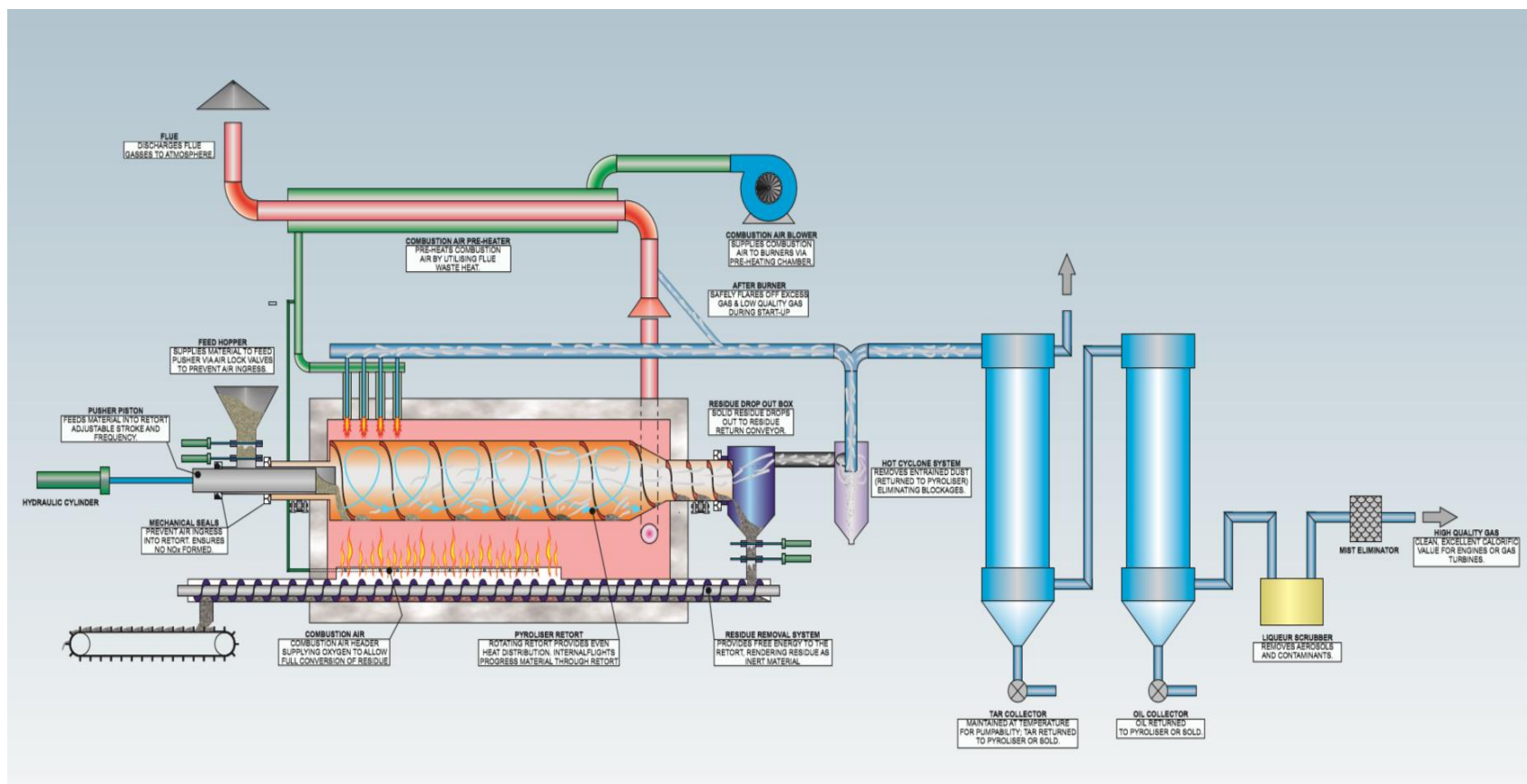


Figure 1. Pyrolysis System